

# HAWAII ADMINISTRATIVE RULES

## TITLE 12

### DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

#### SUBTITLE 8

#### DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

#### PART 2

#### GENERAL INDUSTRY STANDARDS

#### CHAPTER 88.1

#### BAKERY EQUIPMENT

#### §12-88.1-1 Incorporation of federal standard

Historical note: Chapter 12-88.1 is based substantially on chapter 12-88. [Eff 12/6/82; am 8/15/87; am 3/22/91; R 12/29/00]

**§12-88.1-1 Incorporation of federal standard.** Title 29, Code of Federal Regulations, section 1910.263, entitled "Bakery equipment" published by the Office of the Federal Register, National Archives and Records Administration, on June 27, 1974; and the amendments published on October 24, 1978; November 7, 1978, and March 7, 1996, are made a part of this chapter. [Eff 12/29/00] (Auth: HRS §396-4)(Imp: HRS §396-4)

#### **§1910.263 Bakery equipment.**

##### **(a) General requirements.**

- (1) Application. The requirements of this section shall apply to the design, installation, operation and maintenance of machinery and equipment used within a bakery.

##### **(b) [Reserved]**

##### **(c) General machine guarding.**

- (1) [Reserved]
- (2) Gears. All gears shall be completely enclosed regardless of location.
- (3) Sprockets and V-belt drives. Sprockets and V-belt drives located within reach from platforms or passageways or located within 8 feet 6 inches from the floor shall be completely enclosed.
- (4) [Reserved]
- (5) Lubrication. Where machinery must be lubricated while in motion, stationary lubrication fittings inside a machine shall be provided with extension piping to a point of safety so that the employee will not have to reach into any dangerous part of the machine when lubricating.
- (6) [Reserved]
- (7) [Reserved]
- (8) Hot pipes. Exposed hot water and steam pipes shall be covered with insulating material wherever necessary to protect employee from contact.

##### **(d) Flour-handling equipment.**

- (1) General requirements for flour handling.
  - (i) Wherever any of the various pieces of apparatus comprising a flour-handling system are run in electrical unity with one another the following safeguards shall apply:
    - (a) [Reserved]
    - (b) Wherever a flour-handling system is of such size that the beginning of its operation is far remote from its final delivery end, all electric motors operating each apparatus comprising this system shall be controlled at each of two points, one located at each remote end, either of which will stop all motors.

- (c) [Reserved]
  - (d) Control circuits for magnetic controllers shall be so arranged that the opening of any one of several limit switches, which may be on an individual unit, will serve to deenergize all of the motors of that unit.
- (2) Bag chutes and bag lifts (bag-arm elevators).
  - (i) Bag chutes (gravity chutes for handling flour bags) shall be so designed so as to keep to a minimum the speed of flour bags. If the chute inclines more than 30° from the horizontal, there shall be an upturn at the lower end of the chute to slow down the bags.
  - (ii) Bag-arm elevators with manual takeoff shall be designed to operate at a capacity not exceeding seven bags per minute. The arms on the conveyor chain shall be so spaced as to obtain the full capacity of the elevator with the lowest possible chain speed. There shall be an electric limit switch at the unloading end of the bag-arm elevator so installed as to automatically stop the conveyor chain if any bag fails to clear the conveyor arms.
  - (iii) [Reserved]
  - (iv) Man lifts shall be prohibited in bakeries. Bag or barrel lifts shall not be used as man lifts.
- (3) Dumpbin and blender.
  - (i) [Reserved]
  - (ii) [Reserved]
  - (iii) [Reserved]
  - (iv) [Reserved]
  - (v) All dumpbin and blender hoods shall be of sufficient capacity to prevent circulation of flour dust outside the hoods.
  - (vi) All dumpbins shall be of a suitable height from floor to enable the operator to dump flour from bags, without causing undue strain or fatigue. Where the edge of any bin is more than 24 inches above the floor, a bag rest step shall be provided.
  - (vii) A control device for stopping the dumpbin and blender shall be provided close to the normal location of the operator.
- (4) [Reserved]
- (5) [Reserved]
- (6) Storage bins.
  - (i) [Reserved]
  - (ii) Storage bins shall be provided with gaskets and locks or latches to keep the cover closed, or other equivalent devices in order to insure the dust tightness of the cover. Covers at openings where an employee may enter the bin shall also be provided with a hasp and a lock, so located that the employee may lock the cover in the open position whenever it is necessary to enter the bin.
  - (iii) Storage bins where the side is more than 5 feet in depth shall be provided with standard stationary safety ladders, both inside and outside, to reach from floor level to top of bin and from top of bin to inside bottom, keeping the ladder end away from the moving screw conveyor.
  - (iv) [Reserved]
  - (v) [Reserved]
  - (vi) The main entrance cover of large storage bins located at the interior exit ladder shall be provided with an electric interlock for motors operating both feed and unloading screw, so that these motors cannot operate while the cover is open.
- (7) Screw conveyors.
  - (i) [Reserved]
  - (ii) [Reserved]
  - (iii) The covers of all screw conveyors shall be made removable in convenient sections, held on with stationary clamps located at proper intervals keeping all covers dust-tight. Where drop or hinged bottom sections are provided this provision shall not apply.
- (8) Sifters.
  - (i) Enclosures of all types of flour sifters shall be so constructed that they are dust-tight but readily accessible for interior inspection.
  - (ii) [Reserved]
- (9) Flour scales.

- (i) [Reserved]
- (ii) [Reserved]
- (iii) Traveling or track-type flour scales shall be equipped with bar handles for moving same. The bar should be at least 1 inch in diameter and well away from trolley track wheels.

**(e) Mixers.**

- (1) Horizontal dough mixers.
  - (i) Mixers with external power application shall have all belts, chains, gears, pulleys, sprockets, clutches, and other moving parts completely enclosed.
  - (ii) [Reserved]
  - (iii) Each mixer shall be equipped with an individual motor and control, and with a conveniently located manual switch to prevent the mixer from being started in the usual manner while the machine is being serviced and cleaned.
  - (iv) All electrical control stations shall be so located that the operator must be in full view of the bowl in its open position. No duplication of such controls other than a stop switch shall be permitted.
  - (v) All mixers with power and manual dumping arrangements shall be equipped with safety devices which shall:
    - (a) Engage both hands of the operator, when the agitator is in motion under power, and while the bowl is opened more than one-fifth of its total opening.
    - (b) Prevent the agitator from being started, while the bowl is more than one-fifth open, without engaging both hands of the operator;
  - (vi) [Reserved]
  - (vii) [Reserved]
  - (viii) Every mixer shall be equipped with a full enclosure over the bowl which is closed at all times while the agitator is in motion. Only minor openings in this enclosure, such as ingredient doors, flour inlets, etc., each representing less than 1 1/2 square feet in area, shall be capable of being opened while the mixer is in operation.
  - (ix) [Reserved]
  - (x) Overhead covers or doors which are subject to accidental closure shall be counterbalanced to remain in an open position or provided with means to hold them open until positively released by the operator.
  - (xi) [Reserved]
  - (xii) [Reserved]
  - (xiii) [Reserved]
  - (xiv) [Reserved]
  - (xv) [Reserved]
  - (xvi) [Reserved]
  - (xvii) [Reserved]
  - (xviii) Valves and controls to regulate the coolant in mixer jackets shall be located so as to permit access by the operator without jeopardizing his safety.
- (2) Vertical mixers.
  - (i) Vertical mixers shall comply with paragraphs (e)(1)(i), (iii), (ix) and (x), of this section.
  - (ii) [Reserved]
  - (iii) Bowl locking devices shall be of a positive type which require the attention of the operator for unlocking.
  - (iv) Devices shall be made available for moving bowls weighing more than 80 pounds, with contents, into and out of the mixing position on the machine.

**(f) Dividers.**

- (1) [Reserved]
- (2) [Reserved]
- (3) Rear of divider. The back of the divider shall have a complete cover to enclose all of the moving parts, or each individual part shall be enclosed or guarded to remove the separate hazards. The rear cover shall be provided with a limit switch in order that the machine cannot operate when this cover is open. The guard on the back shall be hinged so that it cannot be completely removed and if a catch or brace is provided for holding the cover open, it shall be designed so

that it will not release due to vibrations or minor bumping whereby the cover may drop on an employee.

**(g) Moulders.**

- (1) Hoppers. Mechanical feed moulders shall be provided with hoppers so designed and connected to the proofer that an employee's hands cannot get into the hopper where they will come in contact with the in-running rolls.
- (2) Hand-fed moulders. Hand-fed moulders shall be provided with a belt-feed device or the hopper shall be extended high enough so that the hands of the operator cannot get into the feed rolls. The top edge of such a hopper shall be well rounded to prevent injury when it is struck or bumped by the employee's hand.
- (3) Stopping devices. There shall be a stopping device within easy reach of the operator who feeds the moulder and another stopping device within the reach of the employee taking the dough away from the moulder.

**(h) Manually fed dough brakes.**

- (1) Top-roll protection. The top roll shall be protected by a heavy gage metal shield extending over the roll to go within 6 inches of the hopper bottom board. The shield may be perforated to permit observation of the dough entering the rolls.
- (2) Emergency stop bar. An emergency stop bar shall be provided, and so located that the body of the operator will press against the bar if the operator slips and falls toward the rolls, or if the operator gets his hand caught in the rolls. The bar shall apply the body pressure to open positively a circuit that will deenergize the drive motor. In addition, a brake which is inherently self-engaging by requiring power or force from an external source to cause disengagement shall be activated at the same time causing the rolls to stop instantly. The emergency stop bar shall be checked for proper operation every 30 days.

**(i) Miscellaneous equipment.**

- (1) Proof boxes. All door locks shall be operable both from within and outside the box. Guide rails shall be installed to center the rack as it enters, passes through, and leaves the proof box.
- (2) Fermentation room. Fermentation room doors shall have nonshatterable wire glass or plastic panels for vision through doors.
- (3) Troughs. Troughs shall be mounted on antifriction bearing casters thus making it possible for the operator to move and direct the motion of the trough with a minimum of effort.
- (4) Hand trucks.
  - (i) Casters shall be set back from corners to be out of the way of toes and heels, but not far enough back to cause the truck to be unstable.
  - (ii) A lock or other device shall be provided to hold the handle in vertical position when the truck is not in use.
- (5) Lift trucks. A lock or other device shall be provided to hold the handle in vertical position when the truck is not in use.
- (6) Racks.
  - (i) [Reserved]
  - (ii) Racks shall be equipped with handles so located with reference to the frame of the rack that no part of the operator's hands extends beyond the outer edge of the frame when holding onto the handles.
  - (iii) Antifriction bearing casters shall be used to give the operator better control of the rack.
- (7) Conveyors.
  - (i) Wherever a conveyor passes over a main aisleway, regularly occupied work area, or passageway, the underside of the conveyor shall be completely enclosed to prevent broken chains or other material from falling in the passageway.
  - (ii) Stop bumpers shall be installed on all delivery ends of conveyors, wherever manual removal of the product carried is practiced.
  - (iii) Where hazard of getting caught exists a sufficient number of stop buttons shall be provided to enable quick stopping of the conveyor.
- (8) [Reserved]
- (9) [Reserved]
- (10) [Reserved]
- (11) Ingredient premixers, emulsifiers, etc.

- (i) All top openings shall be provided with covers attached to the machines. These covers should be so arranged and interlocked that power will be shut off whenever the cover is opened to a point where the operator's fingers might come in contact with the beaters.
  - (ii) [Reserved]
- (12) Chain tackle.
  - (i) All chain tackle shall be marked prominently, permanently, and legibly with maximum load capacity.
  - (ii) All chain tackle shall be marked permanently and legibly with minimum support specification.
  - (iii) Safety hooks shall be used.
- (13) Trough hoists, etc.
  - (i) All hoists shall be marked prominently, permanently, and legibly with maximum load capacity.
  - (ii) All hoists shall be marked permanently and legibly with minimum support specifications.
  - (iii) Safety catches shall be provided for the chain so that the chain will hold the load in any position.
  - (iv) Safety hooks shall be used.
- (14) Air-conditioning units.
  - (i) [Reserved]
  - (ii) On large units with doors to chambers large enough to be entered, all door locks shall be operable from both inside and outside.
- (15) Pan washing tanks.
  - (i) [Reserved]
  - (ii) The surface of the floor of the working platform shall be maintained in nonslip condition.
  - (iii) [Reserved]
  - (iv) [Reserved]
  - (v) Power ventilated exhaust hoods shall be provided over the tanks.
- (16) [Reserved]
- (17) [Reserved]
- (18) [Reserved]
- (19) [Reserved]
- (20) Bread coolers, rack type.
  - (i) [Reserved]
  - (ii) All door locks shall be operable from both within and outside the cooler.
- (21) [Reserved]
- (22) Doughnut machines. Separate flues shall be provided, (i) for venting vapors from the frying section, and (ii) for venting products of combustion from the combustion chamber used to heat the fat.
- (23) Open fat kettles.
  - (i) The floor around kettles shall be maintained in nonslip condition.
  - (ii) [Reserved]
  - (iii) [Reserved]
  - (iv) The top of the kettle shall be not less than 36 inches above floor or working level.
- (24) Steam kettles.
  - (i) Positive locking devices shall be provided to hold kettles in the desired position.
  - (ii) Kettles with steam jackets shall be provided with safety valves in accordance with the ASME Pressure Vessel Code, Section VIII, Unfired Pressure Vessels, 1968, which is incorporated by reference as specified in §1910.6.
- (j) Slicers and wrappers.
  - (1) Slicers.
    - (i) [Reserved]
    - (ii) [Reserved]
    - (iii) The cover over the knife head of reciprocating-blade slicers shall be provided with an interlocking arrangement so that the machine cannot operate unless the cover is in place.
    - (iv) On slicers with endless band knives, each motor shall be equipped with a magnet brake which operates whenever the motor is not energized. Each door, panel, or other point of

access to the cutting blades shall be arranged by means of mechanical or electric interlocks so that the motor will be deenergized if all such access doors, panels, or access points are not closed.

- (v) When it is necessary to sharpen slicer blades on the machine, a barrier shall be provided leaving only sufficient opening for the sharpening stone to reach the knife blades.
- (vi) [Reserved]
- (vii) Slicer wrapper conditions.
  - (a) [Reserved]
  - (b) [Reserved]
  - (c) Mechanical control levers for starting and stopping both slicing machine conveyors and wrapping machines shall be extended or so located that an operator in one location can control both machines. Such levers should be provided wherever necessary, but these should be so arranged that there is only one station capable of starting the wrapping machine and conveyor assembly, and this starting station should be so arranged or guarded as to prevent accidental starting. The electric control station for starting and stopping the electric motor driving the wrapping machine and conveyor should be located near the clutch starting lever.
- (2) Wrappers.
  - (i) [Reserved]
  - (ii) [Reserved]
  - (iii) Electrical heaters on wrappers shall be protected by a cover plate properly separated or insulated from the heaters in order that accidental contact with this cover plate will not cause a burn to the operator.
- (k) Biscuit and cracker equipment.**
  - (1) Meal, peanut, and fig grinders.
    - (i) If the hopper is removable it shall be provided with an electric interlock so that the machine cannot be put in operation when the hopper is removed.
    - (ii) Where grid guards cannot be used, feed conveyors to hoppers, or baffle-type hoppers, shall be provided. Hoppers in such cases shall be enclosed and provided with hinged covers, and equipped with electric interlock to prevent operation of the machine with the cover open.
  - (2) Sugar and spice pulverizers.
    - (i) All drive belts used in connection with sugar and spice pulverizers shall be grounded by means of metal combs or other effective means of removing static electricity. All pulverizing of sugar or spice grinding shall be done in accordance with NFPA 62-1967 (Standard for Dust Hazards of Sugar and Cocoa) and NFPA 656-1959 (Standard for Dust Hazards in Spice Grinding Plants), which are incorporated by reference as specified in §1910.6.
    - (ii) Magnetic separators shall be provided to reduce fire and explosion hazards.
  - (3) Cheese, fruit, and food cutters. These machines shall be protected in accordance with the requirements of paragraph (k)(1) of this section.
  - (4) [Reserved]
  - (5) Reversible dough brakes. Reversible brakes shall be provided with a guard or tripping mechanism on each side of the rolls. These guards shall be so arranged as to stop the machine or reverse the direction of the rolls so that they are outrunning if the guard is moved by contact of the operator.
  - (6) Cross-roll brakes. Cross-roll brakes shall be provided with guards that are similar in number and equal in effectiveness to guards on hand-fed brakes.
  - (7) Box- and roll-type dough sheeters.
    - (i) [Reserved]
    - (ii) Hoppers for sheeters shall have an automatic stop bar or automatic stopping device along the back edge of the hopper. If construction does not permit location at the back edge, the automatic stop bar or automatic stopping device shall be located where it will be most effective to accomplish the desired protection.
  - (8) [Reserved]
  - (9) Rotary, die machines, pretzel rolling, and pretzel-stick extruding machines. Dough hoppers shall have the entire opening protected with substantial grid-type guards to prevent the employee

from getting his hands caught in moving parts, or the hopper shall be extended high enough so that the operator's hands cannot get into moving parts.

- (10) [Reserved]
  - (11) [Reserved]
  - (12) Pan cooling towers.
    - (i) Where pan cooling towers extend to two or more floors, a lockout switch shall be provided on each floor in order that mechanics working on the tower may positively lock the mechanism against starting. Only one start switch shall be used in the motor control circuit.
    - (ii) [Reserved]
  - (13) Chocolate melting, refining, and mixing kettles. Each kettle shall be provided with a cover to enclose the top of the kettle. The bottom outlet of each kettle shall be of such size and shape that the operator cannot reach in to touch the revolving paddle or come in contact with the shear point between the paddle and the side of the kettle.
  - (14) [Reserved]
  - (15) [Reserved]
  - (16) [Reserved]
  - (17) Peanut cooling trucks. Mechanically operated peanut cooling trucks shall have a grid-type cover over the entire top.
- (II) Ovens.
- (1) General location.
    - (i) [Reserved]
    - (ii) [Reserved]
    - (iii) [Reserved]
    - (iv) [Reserved]
    - (v) [Reserved]
    - (vi) [Reserved]
    - (vii) Ovens shall be located so that possible fire or explosion will not expose groups of persons to possible injury. For this reason ovens shall not adjoin lockers, lunch or sales rooms, main passageways, or exits.
  - (2) [Reserved]
  - (3) Safeguards of mechanical parts.
    - (i) Emergency stop buttons shall be provided on mechanical ovens near the point where operators are stationed.
    - (ii) All piping at ovens shall be tested to be gastight.
    - (iii) Main shutoff valves, operable separately from any automatic valve, shall be provided to permit turning off the fuel or steam in case of an emergency.
      - (a) Main shutoff valves shall be located so that explosions, fires, etc. will not prevent access to these valves.
      - (b) Main shutoff valves shall be locked in the closed position when men must enter the oven or when the oven is not in service.
  - (4) [Reserved]
  - (5) [Reserved]
  - (6) [Reserved]
  - (7) [Reserved]
  - (8) Electrical heating equipment.
    - (i) [Reserved]
    - (ii) [Reserved]
    - (iii) A main disconnect switch or circuit breaker shall be provided. This switch or circuit breaker shall be so located that it can be reached quickly and safely. The main switch or circuit breaker shall have provisions for locking it in the open position if any work on the electrical equipment or inside the oven must be performed.
  - (9) General requirements.
    - (i) Protecting devices shall be properly maintained and kept in working order.
    - (ii) All safety devices on ovens shall be inspected at intervals of not less than twice a month by an especially appointed, properly instructed bakery employee, and not less than once a year by representatives of the oven manufacturers.

- (iii) (a) Protection of gas pilot lights shall be provided when it is impracticable to protect the main flame of the burner and where the pilot flame cannot contact the flame electrode without being in the path of the main flame of the burner. Failure of any gas pilot shall automatically shut off the fuel supply to the burner.
- (b) Ovens with multiple burners shall be equipped with individual atmospheric pilot lights where there is sufficient secondary air in the baking chamber and where gas is available; or else each burner shall be equipped with an electric spark-type ignition device.
- (iv) Burners of a capacity exceeding 150,000 B.t.u. per hour equipped with electric ignition shall be protected in addition by quick-acting combustion safeguards.
  - (a) The high-tension current for any electric spark-type ignition device shall originate in a power supply line which is interlocked with the fuel supply for the oven in such a way that in case of current failure both the source of electricity to the high-tension circuits and the fuel supply shall be turned off simultaneously.
  - (b) [Reserved]
  - (c) Combustion safeguards used in connection with electric ignition systems on ovens shall be so designed as to prevent an explosive mixture from accumulating inside the oven before ignition has taken place.
- (v) When fuel is supplied and used at line pressure, safety shutoff valves shall be provided in the fuel line leading to the burner.
  - (a) When fuel is supplied in excess of line pressure, safety shutoff valves shall be provided in the fuel line leading to the burners, unless the fuel supply lines are equipped with other automatic valves which will prevent the flow of fuel when the compressing equipment is stopped.
  - (b) The safety shutoff valve shall be positively tight and shall be tested at least twice monthly.
  - (c) [Reserved]
  - (d) [Reserved]
  - (e) A safety shutoff valve shall require manual operation for reopening after it has closed, or the electric circuit shall be so arranged that it will require a manual operation for reopening the safety shutoff valve.
  - (f) Manual reset-type safety shutoff valves shall be so arranged that they cannot be locked in an open position by external means.
  - (g) Where blowers are used for supplying the air for combustion the safety shutoff valve shall be interlocked so that it will close in case of air failure.
  - (h) Where gas or electric ignition is used, the safety shutoff valve shall close in case of ignition failure. On burners equipped with combustion safeguards, the valve shall close in case of burner flame failure.
- (vi) One main, manually operated, fuel shutoff valve shall be provided on each oven, and shall be located ahead of all other valves in the system.
- (vii) All individual gas or oil burners with a heating capacity over 150,000 B.t.u. per hour shall be protected by a safeguard which is actuated by the flame and which will react to flame failure in a time interval not to exceed 2 seconds. All safeguards, once having shut down a gas or oil burner, shall require manual resetting and starting of the burner or burners.
- (viii) Any space in an oven (except direct fired ovens) which could be filled with an explosive mixture shall be protected by explosion vents. Explosion vents shall be made of minimum weight consistent with adequate insulation.
  - (a) Explosion doors which have a substantial weight shall be attached by chains or similar means to prevent flying parts from injuring the personnel in case of an explosion.
  - (b) Where explosion vents are so located that flying parts or gases might endanger the personnel working on or near the oven, internal or external protecting means shall be provided in the form of heavily constructed shields or deflectors made from noncombustible material.
  - (c) Specifically exempted from the provisions of paragraph paragraph (l)(8)(viii) of this section are heating systems on ovens in which the fuel is admitted only to enclosed spaces which shall have been tested to prove that their construction will resist



repeated explosions without deformation are exempt from the requirements of paragraph (l)(8)(viii)(a) and (b) of this section.

- (ix) [Reserved]
- (x) [Reserved]
- (xi) Where the gas supply pressure is substantially higher than that at which the burners of an oven are designed to operate, a gas pressure regulator shall be employed.
  - (a) [Reserved]
  - (b) [Reserved]
  - (c) [Reserved]
  - (d) A relief valve shall be placed on the outlet side of gas pressure regulators where gas is supplied at high pressure. The discharge from this valve shall be piped to the outside of the building.
- (10) Direct-fired ovens.
  - (i) Direct-fired ovens shall be safeguarded against failure of fuel, air, or ignition.
  - (ii) To prevent the possible accumulation of explosive gases from being ignited after a shutdown, all direct-fired ovens with a heating capacity over 150,000 B.t.u. per hour shall be ventilated before the ignition system, combustion air blower, and the fuel can be turned on. The prevention shall insure at least four complete changes of atmosphere in the baking chamber by discharging the oven atmosphere to the outside of the building and entraining fresh air into it. The prevention shall be repeated whenever the heating equipment is shut down by a safety device.
- (11) Direct recirculating ovens.
  - (i) Each circulating fan in direct recirculating ovens shall be interconnected with the burner in such a manner that the fuel is shut off by a safety valve when the fan is not running.
  - (ii) The flame of the burner or burners in direct recirculating ovens shall be protected by a quick-acting flame-sensitive safeguard which will automatically shut off the fuel supply in case of burner failure.
- (12) [Reserved]
- (13) [Reserved]
- (14) [Reserved]
- (15) Indirect recirculating ovens.
  - (i) [Reserved]
  - (ii) [Reserved]
  - (iii) Duct systems (in ovens) operating under pressure shall be tested for tightness in the initial starting of the oven and also at intervals not farther apart than 6 months.